

Application No.: 10/530,870  
Attorney Docket No.: 052275  
Amendment under 37 CFR §1.111

### **REMARKS**

Claims 1-14 are pending in the present application. Claims 11-14 are withdrawn from consideration. Claims 2 and 7 are herein amended.

#### **Specification Objections**

The abstract was objected to since it does not commence on a separate sheet in accordance with 37 C.F.R. § 1.52(b)(4). The Abstract has been amended to commence on a separate sheet. The replacement sheet is enclosed with this Amendment.

Withdrawal of the objection is requested.

#### **Claim Rejections - 35 U.S.C. § 112**

Claim 7 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Office Action states that the use of “may consist of molecules” does not distinguish the device from one that “may not” consist of molecules.

Claim 7 has been amended by removing “may” to recite “the wires consist of molecules.”

Withdrawal of the rejection is requested.

#### **Claim Rejections - 35 U.S.C. § 103**

Claims 1-10 were rejected under 35 U.S.C. § 103(a) as being unpatentable over **Krahne**, *Fabrication Of Nanoscale Gaps In Integrated Circuits*, Applied Physics Letters, American Institute Of Physics, vol. 81, no. 4, pp 730-32, July 22, 2002, in view of **Lieber** (US 7,129,554).

Favorable reconsideration is requested.

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The present invention as recited in the claims is a semiconductor base structure for “molecular electronics” and “molecular electronics-based biosensor” applications. For such device applications, a hybrid system is disclosed with a semiconductor base structure and organic wires. Specifically, it is composed of semiconductor based “nano-gap” electrodes bridged by functionalized “molecular wires.”

Applicants respectfully submit that neither Krahne nor Lieber teach or suggest a “semiconductor base structure for molecular electronics and molecular electronics-based biosensor applications” as recited in claim 1.

Niether Krahne nor Lieber teach a semiconductor base structure for “molecular electronics and molecular electronics-based biosensor.” Furthermore, this feature would not have been obvious based on the teachings of Krahne and Lieber.

The Office Action acknowledges that Krahne does not disclose a structure comprising an organic wire. (Office Action, page 3.) The Office Action cites Lieber for disclosing this feature.

Lieber discloses electrical devices comprising nanoscopic wires. However, Lieber does not disclose “molecular electronics and molecular electronics-based biosensor.” Thus, it would not have been obvious to one of ordinary skill in the art to combine the nanoscopic wires disclosed in Lieber with the structure disclosed in Krahne to form a hybrid system with a semiconductor base structure and organic wires.

Regarding claim 7, Applicants respectfully submit that neither Krahne nor Lieber teach or suggest “wherein the wires consist of molecules of length fitting or exceeding the gap and being terminated and chemical endgroups able to covalently bind to the metal electrodes.” Both

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Krahne and Lieber are silent about these features and these features would not have been obvious to one of ordinary skill in the art.

Regarding claim 8, Applicants respectfully submit neither Krahne nor Lieber teach or suggest “wherein a selective binding of a bio-molecular analyte to the organic nanowire changes the receptor’s electron affinity towards the wire thus modifying its delocalized electron distribution and in turn leads to a change in molecular conductance.” The general biosensing principle is taught in Lieber; however, biosensing is not taught for organic nanowires that change their molecular conductance.

For at least the foregoing reasons, claims 1, 7 and 8 are patentable over the cited references, and claims 2-6, 9 and 10 are patentable by virtue of their dependence from claim 1. Accordingly, withdrawal of the rejection of claims 1-10 is hereby solicited.

In view of the aforementioned amendments and accompanying remarks, Applicants submit that that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants’ undersigned attorney to arrange for an interview to expedite the disposition of this case.

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If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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Enclosure: Abstract Replacement Sheet